

Amendments to the Claims

Please amend the claims as follows:

1. (Original) A method for harvesting bone through a guided delivery instrumentation system which operates through a percutaneous, laparoscopic, minimally-invasive technique, comprising the steps of:

making a small incision above a harvest site;

inserting an elongated guide wire with a blunt proximal end and a pointed distal end into the incision, distal end first, to a bone area to be harvested;

gently impacting the guide wire proximal end whereby the guide wire distal end enters into said bone area in the harvest site;

placing a cylindrical obturator with a generally cylindrical channel centrally formed within said obturator along its central longitudinal axis concentrically over the guide wire;

guiding the obturator onto to the guide wire toward the guide wire distal end whereby the obturator gradually splits muscle and tissue until it contacts said bone;

placing a first, hollow, cylindrical dilator concentrically over said obturator thereby increasing said incision to a percutaneous approach;

removing said guide wire and obturator;

placing an impactor cap over said first dilator;

gently tapping said first dilator with impactor cap into said harvest site bone;

inserting an elongated, hollow, cutting cylinder, said cutting cylinder having a handle on a proximal end and a hollow and a cutting tip on a distal end, into

said first dilator whereby said cutting tip is brought into engagement with said bone;

cutting a portion of said bone with said cutting tip and bringing said cut portion through the hollow cutting tip into the cutting cylinder;
removing the cutting cylinder and cutter tip from the first dilator;
removing the handle from said cutter cylinder;
removing the cut bone from the cutter cylinder;
removing the first dilator from said harvest site; and
closing the incision.

2. (Original) A method for harvesting bone as described in claim 1, further comprising the step of:

placing a second, hollow, cylindrical dilator concentrically over said first dilator.

3. (Original) A method for harvesting bone as described in claim 2, further comprising the step of:

placing a third, hollow, cylindrical dilator concentrically over said second dilator.

4. (Original; Once amended) A method for harvesting bone as described in claim 1, further comprising the steps of:

placing a hollow, cylindrical cannula having a proximal end and distal end, said

distal end being longitudinally notched resulting in two protruding arms parallel to the central axis of said cannula, concentrically over said dilator whereby said cannula distal end engages the bone area; placing an impactor cap over said cannula; and gently tapping said cannula with [impact] impactor cap into said bone area.

5. (Original) A method for harvesting bone as recited in claim 4, further comprising the step of:
placing a second, hollow, cylindrical dilator concentrically over said first dilator.

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6. (Original) A method for harvesting bone as recited in claim 5, further comprising the step of:
placing a third, hollow, cylindrical dilator concentrically over said second dilator.

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7. (Original) A method for harvesting bone as recited in claim 4, further comprising the steps of:
removing said dilator prior to insertion of said cutter cylinder; and inserting said cutting cylinder into said cannula.

8. (Original) A bone harvesting apparatus for the removal of bone material from a living body, comprising:
a guided delivery system, comprising:
an elongated guide wire having a pointed distal end and a blunt proximal end, said

distal end being adapted to engage a bone from which bone material is to be extracted;

a generally cylindrical obturator with an internal, hollow channel formed along an elongated central axis and positioned concentrically over said guide wire, said obturator having a generally dome-shaped distal end adapted to dividing tissue abutting said bone, and a proximal end with gripping means;

a generally cylindrical, hollow, open-ended dilator concentrically positioned over said obturator; and

a generally cylindrical, hollow, open-ended, forked cannula concentrically positioned over said dilator; and

a coring device within said delivery system for extracting precise amounts of bone material.

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9. (Original) A bone harvesting apparatus as recited in claim 8, wherein said guided delivery system is further comprised of:

a plurality of generally cylindrical, hollow, open-ended dilators concentrically positioned over said obturator.

10. (Original) A bone harvesting apparatus as recited in claim 8, wherein: said dilator has a proximal end and a beveled distal end with teeth protruding therefrom.

11. (Original) A bone harvesting apparatus as recited in claim 10, wherein said coring device is comprised of:

a cutter cylinder having a proximal end and a distal end interconnected by a hollow tube;

a hollow cutting tip attached to said cutter cylinder distal end;

a handle joined to said cutter cylinder proximal end; wherein said cutter cylinder and cutting tip are adapted to fitting within said dilator.

12. (Original) A bone harvesting apparatus as recited in claim 10, wherein: said forked cannula has a proximal end terminating in two parallel, block-like elements, and a distal end longitudinally notched resulting in two longitudinally protruding arms parallel to a central, longitudinal cannula axis.

13. (Original) A bone harvesting apparatus as recited in claim 12, wherein said coring device is comprised of:

a cutter cylinder having a proximal end and a distal end interconnected by a hollow tube;

a hollow cutting tip attached to said cutter cylinder distal end;

a handle joined to said cutter cylinder proximal end;

wherein said cutter cylinder and cutting tip are adapted to fitting within said dilator.

14. (Original) A bone harvesting apparatus as recited in claim 11, wherein: said cutting tip has a proximal end joined to the cutter cylinder distal end and a distal end having two, protruding, generally triangular flat blades, each having two lateral

sides and a distal tip, said distal tips being connected to each other, each said blade lateral side being formed into a cutting edge, said cutting tip distal end also terminating in two cutting edges positioned between said protruding blades.

15. (Original) A bone harvesting apparatus as recited in claim 13, wherein: said cutting tip has a proximal end joined to the cutter cylinder distal end and a distal end having two, protruding, generally triangular flat blades, each having two lateral sides and a distal tip, said distal tips being connected to each other, each said blade lateral side being formed into a cutting edge, said cutting tip distal end also terminating in two cutting edges positioned between said protruding blades.

16. (New; Twice amended) A method of harvesting bone, the method comprising:

inserting a guidance member through a percutaneous incision to a bone, at a bone harvest site;

sequentially inserting at least one member of a set of dilation channels through the incision with a first dilation channel of the set having been positioned over the guidance member;

inserting a cutter device through the member of the set of dilation channels to engage the bone harvest site; and

cutting the bone with the cutter device to bring a portion of the bone into the cutter device's interior.

17. (New) A method according to claim 16, the method further comprising:
making a percutaneous incision, that is at most 2 centimeters in length, above the
bone harvest site.

18. (New; twice amended) A bone harvesting apparatus, the apparatus
comprising:

a guidance member adapted to engage a bone from which bone material is to
be extracted;

a set of at least one dilation channel and a first dilation channel being adapted to
be positioned over the guidance member; and

a cutter device adapted to be inserted into a member of the set of dilation
channels to engage the bone, the cutter device comprising a hollow collection
shaft.

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19. (New) A bone harvesting apparatus according to claim 18, wherein the cutter
device is disposable.

20. (New; Twice amended) A bone harvesting apparatus according to claim 18,
wherein the at least one channel is adapted to move in an arcing motion over the bone to
permit the cutter device to harvest bone from more than one position.

21. (New; Twice amended) A bone harvesting apparatus according to claim 18, wherein the at least one channel comprises a pair of members protruding from its distal end to position itself against the bone.

22. (New) A bone harvesting apparatus according to claim 21, wherein one arm of the pair of members is longer than the other arm of the pair of members.

23. (New) A bone harvesting apparatus according to claim 21, wherein one arm of the pair of members is of equal length to the other arm of the pair of members.

24. (New; Twice Amended) A bone harvesting apparatus according to claim 18, wherein the at least one channel comprises means for docking to the bone.

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25. (New) A bone harvesting apparatus according to claim 24, wherein the means for docking comprises an arcuate sharp edge.

26. (New; Once amended) A bone harvesting apparatus, the apparatus comprising:

a collection shaft; and

a stainless steel cutting tip permanently attached to the collection shaft, the cutting tip comprising openings adapted to allow cut bone chips to move into the collection shaft's interior and two protruding blades.

27. (New) An apparatus according to claim 26, wherein the cutting tip is bonded to the collection shaft.

28. (New) An apparatus according to claim 26, wherein the cutting tip is mechanically fastened to the collection shaft.

29. (New) An apparatus according to claim 26, wherein the cutting tip is ultrasonically welded to the collection shaft.

30. (New) An apparatus according to claim 26, wherein the collection shaft comprises a biocompatible polycarbonate material.

31. (New; Once amended) A bone harvesting apparatus, the apparatus further comprising:

a cutter device comprising, at the proximal end of a collection shaft, a depth gage that indicates a depth to which the cutter device has advanced into a patient's bone; and
calibration marks at the distal end of the collection shaft that indicate a volume of bone harvested.

32. (New) A bone harvesting apparatus according to claim 31, wherein the depth gage is readable when the cutter device is inserted into a dilation channel.

33. (New; Once amended) A method of harvesting bone, the method comprising:
creating a conduit from a patient's skin to a bone harvest site through a small
incision in the patient's skin;
expanding the diameter of the conduit by inserting, into the small incision, a
dilation channel;
inserting a cutter device, comprising a hollow collection shaft, into the small
incision; and
expanding the diameter of the conduit by inserting a plurality of dilation channels
of sequentially increasing size.

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34. (New; Once amended) A method of harvesting bone, the method comprising:
inserting a hollow cylindrical coring device, comprising a permanently attached
cutting tip, through a guided delivery system to engage a bone harvest site;
and
directing a downward force on the coring device, the downward force engaging a
downward-facing cutting edge against the bone harvest site, the downward-
facing cutting edge extending in a circumferential direction with respect to a
circle in a plane perpendicular to a longitudinal axis defined by a shaft of the
coring device,
wherein the downward-facing cutting edge extends circumferentially around less
than a full circle.

35. (New; Once amended) A method according to claim 34, wherein the hollow cylindrical coring device is inserted through a percutaneous incision.

36. (New; Once amended) A method according to claim 34, wherein the cutting tip is bonded to the coring device.

37. (New; Once amended) A method according to claim 34, wherein the cutting tip is mechanically fastened to the coring device.

38. (New; Once amended) A method according to claim 34, wherein the cutting tip is ultrasonically welded to the coring device.

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39. (New) A coring device for harvesting bone, the coring device comprising:
a hollow cylindrical shaft defining a longitudinal axis; and
a cutting tip permanently attached to the shaft, the cutting tip being configured to
permit harvested bone to pass into the hollow cylindrical shaft and comprising:
two protruding blades joined at one end, each protruding blade comprising a
counterclockwise cutting edge and a clockwise cutting edge; and

two downward-facing cutting edges, each extending in a circumferential direction with respect to a circle in a plane perpendicular to the shaft's longitudinal axis.

40. (New; Once Amended) A coring device according to claim 39, wherein the cutting tip further comprises:

two support blades, each support blade comprising a counterclockwise cutting edge and a clockwise cutting edge and extending between a support section of the cutting tip and one of the protruding blades.

41. (New; Once Amended) A coring device according to claim 39, wherein the two protruding blades are at a 45° angle to the shaft's longitudinal axis.

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42. (New; Once Amended) A coring device according to claim 39, wherein the cutting tip is bonded to the hollow cylindrical shaft.

43. (New; Once Amended) A coring device according to claim 39, wherein the cutting tip is mechanically fastened to the hollow cylindrical shaft.

44. (New; Once Amended) A coring device according to claim 39, wherein the cutting tip is ultrasonically welded to the hollow cylindrical shaft.
